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ABSTRACT

This paper focuses on an analysis of relationships among interactive behavior, interactive decision making, and interactive processing of information about pupils as perceived by teachers in the course of a lesson. Three teachers participated in the study. In response to a general request to state their plans for the lesson, the teachers consistently mentioned content to be covered and activities to be engaged in, and frequently mentioned the materials to be used in the planned lesson. The influence of the discrepancy between the teacher's expectations and the actual events during the lesson on teacher decision making is illustrated in three case studies corresponding to three different degrees of teacher-perceived discrepancy between plans and classroom reality. (JD)

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TEACHER PLAN AND CLASSROOM REALITY:

THE SOUTH BAY STUDY, PART IV

Greta Morine-Dershimer

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Abstract

A case study approach to analysis of reading lessons was taken. Data on interactive behavior, interactive information processing, and teacher conceptions of pupils were integrated and a critical variable was identified for consideration in further studies of teacher decision making. This variable is the amount of teacher-perceived discrepancy between teacher plan (mental image or expectation for the lesson) and classroom reality (actual events in the lesson). Three different types of information processing and decision making were identified, corresponding to three different degrees of teacher-perceived discrepancy between plan and reality. These were:

1. Little or no discrepancy -- "image-oriented" information processing and "routine" decisions;
2. Minor discrepancy -- "reality-oriented" information processing and "inflight" decisions; and
3. Critical discrepancy -- "problem-oriented" information processing and "postponed" decisions.

AN INTRODUCTION TO THE SOUTH BAY STUDY[1,2]

Studies of teaching have, for the most part, concentrated on the visible events in classrooms and other places where teaching takes place. Over 100 systems have been developed to record and categorize teacher and student behavior in a variety of ways.[3] The use of these systems has resulted in a growing field of knowledge about the visible behavior of teachers and students as they interact with one another.

Teaching as Behaving: The Visible Acts

The results of inquiries into teaching can be interpreted from several points of view.

One interpretation suggests that extremely strong normative pressures operate to shape teaching behavior. These pressures have great force in the early years of a teacher's career (including the training period).

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[1]This introduction is included, in its entirety, in all four IRT published reports on the South Bay Study: Teaching Styles at South Bay School: The South Bay Study, Part I (Res. Ser. No. 57), K. McNair and B. Joyce; Teachers' Thoughts While Teaching: The South Bay Study, Part II (Res. Ser. No. 58), K. McNair and B. Joyce; Teachers' Conceptions of Pupils: The South Bay Study, Part III (Res. Ser. No. 59), G. Morine-Dershimer; and Teacher Plan and Classroom Reality: The South Bay Study, Part IV (Res. Ser. No. 60), G. Morine-Dershimer.

[2]The researchers in the South Bay Study were Greta Morine-Dershimer of Syracuse University, Bruce Joyce of Brooksend Laboratories, and Kathleen McNair of the California State Department of Education.

[3]See Anita Simon and Gil Boyer (Eds.), Mirrors for Behavior. Philadelphia: Research for Better Schools, for a compendium of instruments.

They move teachers toward what Hoetker and Albrand (1969) have termed a "recitation style"[4] of teaching. This interpretation emphasizes the finding that many teachers appear to use similar approaches (usually variations on the recitation style).

Other researchers have reported that variety in teaching is associated with pupil learning (e.g., Flanders, Note 1), suggesting that those who are not completely co-opted into the recitation style are more effective teachers because their wider repertoire enables them to reach more learners and pursue more goals than those who use only one style.

Dunkin and Biddle (1974) have organized their research somewhat differently, providing a picture of the relationships between variations in teaching style and skill and measures of effectiveness (usually measures of student learning). These authors are generally pessimistic because correlations between measures of teacher behavior and student learning are frequently quite low.

Rosenshine (1971), on the other hand, has taken an optimistic view, emphasizing that a number of studies of certain teaching "skills" report positive correlations with measures of student learning.

Gage (1978) presents research on teaching as a growing base of understanding. He believes that teaching is a complex art which science informs gradually. To expect a few dimensions of teaching to correlate directly and highly with any few measures of pupil learning, he says, belies both its many-sidedness and the state of development of inquiry into it.

Gage's view that teaching is complex, and that concepts describing it will have to reflect that complexity is supported by the findings of

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[4] A style in which the teacher asks questions to elicit knowledge of facts, and the student responds in kind (Hoetker & Albrand, 1969).

several recent studies. For example, McDonald and Elias, Note 2) and Berliner (1976), in separate phases of the same large, long-term investigation, report evidence that clusters or patterns of teacher behaviors may be associated with complexes of variables of student achievement. They suggest that single aspects of teacher behavior are unlikely to be powerful determinants of student learning.

There are still other questions about stability of teaching styles, that is, how consistently teachers behave over time. Medley (1977) has reported that a number of teaching style dimensions are relatively stable (that measures of teaching behaviors at one point in time are correlated with those measures at another point in time). Shavelson (1976), on the other hand, argues that the correlations between aspects of teacher behavior across time are moderate -- too low to permit characterization of teachers in terms of style regularities. We (the South Bay Study researchers) believe that certain aspects of teacher behavior are reasonably stable across time (Medley's position), and that there are probably clusters of teacher behavior which are related to certain aspects of student achievement (McDonald & Berliner's opinion). Research must go a long way, however, before causal relationships can be established between important dimensions of teacher behavior and student achievement, even though knowledge is accumulating.

Teaching as Thinking: The Inner Acts

In sharp contrast to the large amount of research on the observable aspects of teaching behavior is the tiny quantity that has been devoted to the study of how teachers think -- how they process information. What do teachers think about the individuals they interact with? What kinds of decisions do they make? What kinds of information do they receive from the

confusing world of the classroom, and how do they deal with that information? How do teachers plan lessons and units? What constraints do they perceive? How many alternatives do they consider? How do they categorize their students and why?

Most of the tiny group of studies on teacher thinking have not been designed from a naturalistic point of view. Zahorik (Note 3) points out that planning has typically been studied from a prescriptive stance, focusing on ideal models and recommendations rather than how teachers in practice typically prepare for lessons. For example, much research on preactive decision making has assumed that teachers diagnose student learning, develop behavioral objectives, and otherwise follow classic "instructional-systems" models. But naturalistic investigations have indicated that very few teachers actually use such a behavioral analysis in preparing for their lessons (Popham & Baker, 1970).

Fifteen years ago, Joyce and Harootunian (1966), studying the decision-making processes of preservice teacher candidates, discovered that the major decisions were made in relation to instructional materials for children. The teachers' major sources of information about science came from children's literature rather than from adult-oriented books or manuals that accompany the instructional systems prepared by textbook publishers. Scientific knowledge about the kinds of information that teachers use for making "inflight" decisions is almost nonexistent.

Except for the investigations by Clark and Joyce (1979), Crist, Marx, and Peterson (Note 4), and Morine-Dershimer and Vallance (Note 5), there have been almost no studies of information processing during teaching prior to this study. Thus, although *overt* teacher behavior has been subjected to analysis by numerous category systems, there are few ways of classifying the kinds of teacher thinking that go on regularly during the course of teaching. Yet, until the thoughts and feelings which occur

during teaching are explored, the visible observed behaviors may not be understood.

When a teacher asks a question, an observer can record the visible behavior clearly enough without understanding the mind that formualtes the question. However, the result is only a record. Unless the thought behind the utterance is known, little can be known about what caused it. If researchers and educators care to use information about teaching as a basis for improving it, they need to understand *why* teachers behave as they do.

The investigation reported here builds on this limited body of research to explore and try to explain relationships between the teaching styles of a small group of teachers in one school and the types of information those teachers seek and use as they teach.

Relationship to Prior Studies

The South Bay Study builds directly on two prior studies, one directed by Joyce at Stanford University (Clark & Joyce, 1979; Crist, Marx, & Peterson, (Note 4), and one conducted by Morine-Dershimer at the Far West Laboratory for Educational Research and Development (Morine & Vallance, Note 5; Morine-Dershimer & Vallance, Note 6).

The Stanford study examined teacher decision making in a laboratory setting. Twelve teachers taught new instructional units to junior high school students previously unknown to them. They taught each unit to three different groups of eight students each on three different days. Teacher planning (Peterson, Marx, & Clark, Note 7), interactive decision making (Clark & Peterson, Note 8), and teacher judgment of pupils (Marx, Note 9) were all examined in this study.

The Beginning Teacher Evaluation Study (BTES) conducted by the Far West Laboratory examined teacher decision making in a semi-controlled setting. Forty elementary school teachers identified as "more effective" or "less effective" (Berliner, Note 10) taught two lessons based on curriculum content new to them to a randomly stratified sample of pupils from their own classrooms; later, they engaged in some simulated planning tasks. Teacher planning (both short-term and long-term), interactive decision making, teacher judgments of pupils, teacher judgments of other teachers, and pupil perceptions of teachers were all examined.

The Stanford and BTES studies used somewhat different techniques to collect data on teacher decision making, and arrived at complementary findings. The South Bay Study incorporated some data collection procedures from these earlier studies, as well as instituting some new procedures. The similarities and differences are described here to illustrate the continuity of these three studies.

The Investigation of Short-Term Planning

In the study directed by Joyce at Stanford, teachers were given new curriculum materials and a period of time in which to plan a day's unit of instruction. The teachers were asked to "think aloud" as they planned; their oral planning was tape recorded and later coded under categories such as objectives, materials, subject matter, and process. The study's results indicate that teachers spent most of their planning time dealing with content to be taught. The teachers' second largest area of concentration was on instructional processes (teaching strategies and lesson activities). The smallest proportion of their planning time was spent on identifying lesson objectives.

In the BTES, Morine-Dershimer collected teachers' written plans for two lessons in mathematics and reading, both dealing with content provided by researchers and new to teachers. These plans were analyzed

to determine degree of specificity, type of format, amount of attention to goals, pupil readiness, evaluation procedures, and alternative procedures. Teachers tended to be fairly specific in their written plans and used an outline format, but they included very few statements regarding behavioral goals, diagnosis of student needs, evaluation of learning, or possible alternative activities. The "more effective" teachers made more specific statements in their written plans, and mentioned instructional processes to be used more often than the other teachers did.

In the South Bay Study, teachers planned and taught lessons in reading, following the curriculum they normally used, to groups of pupils in their own classrooms. These teachers were interviewed about their plans in the morning before their reading lessons began. They described their general plan, and then answered questions about diagnosis of pupil needs, use of instructional materials, specific lesson objectives, teaching strategy, and seating arrangements. While diagnosis of pupil needs, lesson objectives, and seating arrangements were seldom mentioned in the initial plan statements, teacher responses to probing questions clearly demonstrated that these aspects of the lessons were not being ignored but rather, were part of their "mental image" or set of expectations for the lesson.

The Investigation of Interactive Decision Making

In the Stanford study, interactive decision making was investigated by use of a "stimulated recall" technique. An interviewer showed each teacher four brief (two to three minutes long) videotaped segments of classroom interaction, randomly selected from a 50-minute lesson. After viewing each segment, the teacher answered a series of questions, as follows:

1. What were you doing here?
2. What were you noticing about pupils?
3. Did you have any instructional objectives in mind at this point?

4. Were you considering any alternative actions here?

5. Was there anything in this situation that caused you to behave differently than you had planned?

The principal findings were: (1) teachers considered alternative atrategies only when the lesson was going poorly, (2) the primary cue used to judge how well the lesson was going was student participation and involvement, and (3) teachers rarely changed from their planned strategy, even when instruction was going poorly.

The BTES also used a stimulated recall technique to explore interactive decision making. But in this case the entire 20-minute lesson was videotaped and played back to the teacher, who was instructed to stop the tape at any point at which s/he was aware of having made a decision. In addition, the interviewer stopped the tape at a point where a pupil gave an incorrect answer and a point where there was a transition from one activity to another. At each decision point the teacher was asked:

1. What were you thinking about here?

2. What were you noticing that made you stop and think?

3. What did you decide to do?

4. Did you consider any alternatives?

The decision points identified by teachers in this study were related mainly to interchanges (decisions stemming from immediate verbal interaction) or planned activities (interactive decisions stemming from preactive decisions). Teachers focused on instructional process in discussing the substance of their decisions, but shifted to a focus on pupil characteristics when discussing the basis for these decisions. Few alternatives were considered. The "less effective" teachers tended to mention a larger number of items that they were taking into account on almost all aspects of decisions discussed than the "more effective" teachers. That is, they appeared to be attempting to process more information at a given

decision point than the "more effective" teachers.

The South Bay Study incorporated some techniques from both previous studies in conducting stimulated recall interviews, as well as adding some new investigative procedures. A teacher was videotaped during two reading lessons on the same day, one with a high ability group, and one with a low ability group. At the end of the day both lessons were played back to the teacher, first using two random stops for each lesson (as in the Stanford study), then playing the entire lesson back, stopping the tape at teacher-identified decision points (as in the BTES). Interviews were conducted at four different points in the school year, to investigate changes over time. Interactive behavior during lessons was observed and coded to compare teacher decision making with classroom behavior.

The Investigation of Teacher Judgments About Pupils

Teachers in the Stanford study were asked after each new lesson they taught to predict the rank-order of their students in that lesson on a cognitive achievement test and an attitude inventory, which were administered after the third teaching episode. (The students were unknown to the teachers before the lesson, and each lesson was taught to a different group of pupils.) In addition, teachers were asked to describe the student cues they used in making these predictions. The most frequently mentioned cue was "student participation." Regression equations using the behavioral cues identified by teachers were not good predictors of actual student achievement or attitude inventory results. Findings suggested that teacher judgments about student attitudes were more accurate than their judgments about cognitive achievement.

In the BTES, a "pupil sort task" was used to explore teacher judgments about pupils. After teaching two new lessons to their students, teachers were asked to sort their pupils into groups based on something

they had observed about pupils during the lesson. The procedure was repeated until the teacher could think of no new basis for regrouping pupils. The most frequently used basis was pupil participation. The "more effective" teachers generated more groupings using cognitive characteristics as bases for categorizing, and also formed more groups where a pupil was singled out as being too different on a given characteristic to be grouped with other pupils.

The South Bay teachers were interviewed using the pupil sort task at five different points in the school year; this was done to explore changes over time in pupil characteristics being observed. Teachers were asked to predict pupil success in reading three times (September, November, and June). These predictions were compared to pupil performance on standard achievement tests to determine "accuracy" of teacher judgments. The predictions were compared to teacher rankings of pupils on other teacher-identified pupil characteristics to identify the cues used by teachers in making predictions.

The Continuity of Investigation

The three studies can be viewed as a series of investigations which explore a basic set of questions, using somewhat different research settings and data collection techniques. The findings of the first two studies complement and support each other in important ways. The findings of the South Bay Study extend, refine, and throw new light on the findings of the earlier exploratory studies. In addition, the results of the South Bay Study suggest new questions for future research.

The Purpose of the South Bay Study and Background Information

Our major objective in this study was to develop one or more paradigms for viewing the ways that teachers process information, and

to generate and adapt methodologies by which information processing can be studied efficiently and comprehensively. The South Bay Study is essentially a case study of a single elementary school in a large metropolitan area. It focuses on the variety and stability of the information-processing behavior of 10 teachers.

The South Bay School is staffed by 20 teachers, a principal, an assistant principal, and two secretaries; it is served by three specialists who are shared with other schools. The school qualifies for extensive ESEA Title I (federal) and SB 90 EDT (state) funds by virtue of the economic conditions of its neighborhood.

In recent years, state and national funds have resulted in teachers' participation in the selection and purchase of extensive instructional materials, especially in the areas of reading and mathematics. These include self-instructional stations for reading and arithmetic, "concrete aids," "supplementary readers," and a variety of audiovisual materials and "skill-builders."

The 10 teachers who participated in the study teach grades one to five. One of them was male; nine were white and one was black. All 10 teachers had taught for at least three years. Teachers designated as 101, 102, and 103 taught first-grade; Teachers 104 and 105 taught third grade; Teacher 106 taught fourth-grade; Teachers 107 and 108 taught fifth-grade; and Teachers 109 and 110 taught special education.

Study Design and Methodology

The South Bay Study examined three aspects of teacher behavior and thinking:

1. Interactive teaching styles, as revealed by observation of verbal interaction, including an examination of variations between teachers and stability of styles over time.

   "How do the teachers teach?" "How are they similar?" "How do they differ?" "How consistently do they teach?"

2. Thought processes while teaching, as revealed through "stimulated recall" techniques.

   "What do they think about as they teach?" "How similarly (differently?) do they think?" "How consistent are their thoughts over time?"

3. Teacher conceptions of pupils, as revealed by categories used to describe students and predict their behavior.

   "How do they describe the children?" "How similarly (differently) do they perceive the children?" "How (and how well) do they predict performance?

The Investigation of Teaching Styles

Each of the 10 teachers was observed 12 times in the course of the 1976-77 year for a total of 120 observations.

Observers were trained to use a complex category system developed over the years that is sensitive to variations in teaching style and strategy.[5] Data collected were analyzed to describe similarities and differences among teachers and across time, to determine stylistic differences between curriculum areas, and to determine whether the transactions between teachers and students varied with student ability. The purpose of this aspect of the investigation was to develop a picture of the teaching going on in the school, and its stability and variety.

The Study of Information Processing

Altogether, 60 lessons were videotaped as the teachers worked. Each of these tapes was played back to the teacher concerned and s/he was interviewed to recapture the thoughts that were in his/her mind as events occurred during the videotaped episode. The protocols derived from these "stimulated recall" interviews formed the basis for the descriptions of interactive information processing. Analysis of these protocols focused on the content of the recalled thoughts and was structured to determine similarities and differences among the teachers and across time, between subject areas, and between ability groups of students. In addition, we

[5] This system is described in Appendix A of Part I.

attempted to determine relationships between teachers and decision making styles.

We also interviewed teachers to determine their perceptions of their own teaching styles and information-processing behavior. Characterizations were developed of the teaching and information-processing styles of each teacher, and these were reported to the teacher for confirmation or disconfirmation.

Conceptions of Pupils

On five occasions throughout the school year, the teachers were asked to categorize their students and describe the bases they used for observing the children as they worked with them (what cues they used, how they put together those cues to describe the children, and the meaning of these descriptions for their teaching decisions). These data were analyzed to determine normative tendencies, differences between teachers, and the stability of characterizations of the students across time. We also analyzed the data to try to learn how teachers arrived at their characterizations of students, whether or not changes resulted from continued exposure to the children, and the influence of a variety of sources of information about pupils (direct observation, conferences with parents, test scores, etc.).

Organization of the Report

The report of the South Bay Study is organized into four separate papers:

1. The Teaching Styles at South Bay School: The South Bay Study, Part I by K. McNair & B. Joyce. This paper focuses primarily on the general patterns of teaching styles in the South Bay School. The patterns exhibited are those of the "recitation method," or in current parlance, "direct teaching."

2. Teachers' Thoughts While Teaching: The South Bay Study, Part II by K. McNair and B. Joyce. This paper examines teachers' thought processes while teaching. Stimulated recall interviews of teachers were used to obtain data for analysis.

3. Teacher Conceptions of Pupils -- An Outgrowth of Instructional Context: The South Bay Study, Part III by G. Morine-Dershimer. This paper reports the general patterns of teacher processing of information about pupils, including teacher conceptions of pupils and predictions of pupil success. The influence of the instructional context on teacher information processing is highlighted.

4. Teacher Plan and Classroom Reality: The South Bay Study, Part IV by G. Morine-Dershimer. This paper focuses primarily on an analysis of relationships among interactive behavior, interactive decision making, and interactive processing of information about pupils within specific lessons. The influence of the discrepancy between the teacher's expectations and the actual events in the lesson on teacher decision making is illustrated in three case studies.

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Teacher Plan and Classroom Reality: The South Bay Study, Part IV

Greta Morine-Dershimer[1]

The South Bay Study was designed to collect data over time on both the behavior and the thinking of a small group of teachers, with the expectation that the two types of data would be related and that these relationships would serve to illuminate the process of teaching. This paper presents a microcosmic examination of the data, focusing on the critical relationship between teacher plan and classroom reality in individual lessons. The discrepancy between these two entities turned out to be an important factor in the information processing and decision making of the South Bay teachers.

This paper differs from the other three reports of the study in three ways:

1. The analysis presented here integrates all three sets of data (interactive behavior, interactive information processing, and teacher conceptions of pupils), while the preceding papers have examined each data set separately.

2. The approach focuses on the individual teacher engaged in planning and teaching a specific lesson, rather than on the general patterns of a group of teachers; the lessons analyzed here were all taught in January, when classroom routines were well established.

3. The analysis of stimulated recall protocols has been expanded to include categories other than expressed teacher concerns.

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[1]Greta Morine-Dershimer, formerly with the Far West Laboratory, is now a professor in the School of Education at Syracuse University.

Method

Coding Stimulated Recall Protocols

The category system used here to code stimulated recall protocols is a refined version of a system we developed in an earlier study of teacher decision making (Morine & Vallance, 1975). This system includes four major types of categories:[2]

1. *Type of Decision Point* (pupil-related decision, plan-related decision, supplementary decision, explanation of routine procedures, or description of specific events).

2. *Instructional Concerns* (pupil learning, pupil attitudes, pupil behavior, lesson content-information, lesson content-skill or process, typical procedures, modification of procedures, commercially produced instructional materials, teacher-produced instructional materials, plan-related pacing, or pupil-related pacing).

3. *Sources of Information* (observation of pupils' verbal behavior, observation of pupils' nonverbal behavior, teacher expectation, teacher recall of prior knowledge, or teacher records).

4. *Teacher Awareness* (principles of instruction identified, teacher feelings expressed, or alternative procedures identified).

At any one decision point, a teacher could mention several types of instructional concerns, several sources of information, or several types of awareness. For each subcategory, a measure was derived indicating the percentage of decision points at which the teacher mentioned that particular type of concern, source of information, or awareness.

Pulling Out the Plan

A "teacher plan"[3] is not a simple entity to identify. A variety of

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[2] See appendix for definitions and examples of categories and subcategories.

[3] In this study, the phrase "teacher plan" refers to the teacher's detailed and comprehensive image or set of expectations for the lesson, rather than a written lesson plan. It is this mental plan which a teacher carries into the interactive phase of the lesson, and which appears to guide interactive information processing.

procedures have been used to ferret out the kinds of decisions that teachers make in planning. Zahorik (Note 1) asked teachers retrospectively to list these decisions in the order in which they were made. Peterson, Marx, and Clark (1978) had teachers plan aloud into a tape recorder. Yinger (Note 2) made extensive observations of a teacher's activities during the preactive phase, and recorded her planning decisions as she "thought aloud." These studies indicated that preactive decisions tend to focus on subject matter content and instructional activities, rather than on lesson objectives. But the preactive decisions and the written plan are two very different things.

Teachers typically record only minimal information about their lesson plans in their weekly plan books. Participants in the Beginning Teacher Evaluation Study (BTES) (Morine-Dershimer, Note 5) agreed to write lesson plans and submit them to interviewers, but stated that this was not their normal style of preparing for lessons. A comparison of these lesson plans with actual activities in the subsequent lessons revealed that these teachers had made preactive decisions about several important aspects of lessons that were not mentioned in their written plans (Morine-Dershimer, Note 3).

In the South Bay Study, a planning interview was conducted with each teacher in an effort to pull out the "unstated plans." Just before the school day started, the teacher was asked what s/he had planned for the reading lesson that was to be observed later that day. This rather general question was followed by a series of specific probes:

1. Is there anything about the pupils that you want to comment on in relation to your planning?

2. Is there anything about the materials that you have selected that you want to comment on in relation to your planning?

3. Did your planning result in a specific dominant objective for this particular lesson?

4. Could you comment on your teaching strategy, or the instructional process you're planning to use?

5. Is there anything about the seating arrangement that you'd like to comment on in relation to your planning for this lesson?

6. Is this lesson different in any way from your typical reading lesson?

7. Was your planning for this lesson different in any way from your typical planning?

In response to the general request to state their plans, the South Bay teachers consistently mentioned content to be covered and activities to be engaged in, and frequently mentioned the materials to be used in the planned lesson. This pattern of response was quite similar to patterns reported in previous studies (Zahorik, Note 1; Peterson et al., 1978). While the South Bay teachers rarely mentioned pupil ability, specific objective, teaching strategy, or seating arrangement in their responses to the general question, their ready responses to the probing questions indicated that their mental plans, or images of the lessons to be taught, did include these aspects of instruction. Thus their mental images were more detailed and covered more aspects of the lesson than their recorded plan. This finding was similar to that of the BTES (Morine-Dershimer, Note 3).

Determining Discrepancy Between Plan and Reality

A critical variable that emerged from the analysis of individual lessons is the amount of discrepancy that exists between the teacher plan and the classroom reality.[4] In stimulated recall interviews, as well as in planning interviews, the South Bay teachers revealed a great deal

[4]Discrepancy refers to the teacher's perception of how closely the actual events approximated his/her expectations about how the lesson would probably proceed.

about their mental lesson plans, and they indicated how closely the actual lesson approximated their mental image.

The amount of teacher-perceived discrepancy between plan and reality was measured by: (1) the proportion of decision points at which a teacher expressed "surprise" at the event under discussion, or otherwise indicated that the event did not fit well within the teacher's set of expectations for the lesson; and (2) the proportion of decision points at which the teacher reported being disturbed or bothered by the event under discussion.

A lesson where there was little or no perceived discrepancy between plan and reality was one in which less than 25% of the teacher-identified decision points in the lesson were described as "non-expected" events. Here, I found that teacher information processing was "image-oriented," with teacher recall of previous knowledge about pupils playing an important part. Decision points were handled by established routines.

A lesson showing a minor discrepancy between plan and reality was one where 50% or more teacher-identified decision points were described as non-expected events, but less than 25% were described as disturbing or bothersome. I found that teacher information-processing in this situation was "reality oriented," with a fairly narrow range of pupil behavior being observed. Decision points here were handled by "inflight decisions.

A lesson showing a critical discrepancy was one where 50% or more of the decision points were described as non-expected events, and 50% or more were also described as disturbing or bothersome. Here, I found that teacher information processing was "problem-oriented," with teachers tapping a broad spectrum of information about pupils. Decisions in this case were postponed to a later time.

Case Studies

Patterns in discrepancy between plans and actual lessons are illustrated by the cases of three of the teachers who participated in the South Bay Study. Each case was developed from the following types of information:

1. the teacher's general patterns of classroom interaction, interactive information processing, and conceptions of pupils;
2. a specific lesson planned and taught by the teacher in January, when classroom routines were well established;
3. the patterns of classroom interaction, interactive information processing, and conceptions of pupils exhibited in this specific lesson; and
4. the degree of teacher-perceived discrepancy between lesson plan and classroom reality.

Results and Discussion

The three teachers described here differed from each other in their approaches to the teaching of reading, but they were all quite representative of the central tendencies of interactive behavior and thinking reported in Parts I and II of the South Bay Study. Furthermore, the lessons described here were fairly typical for each teacher.

The case studies are presented in a sequence that corresponds to their placement along a continuum of perceived discrepancy between teacher plan and classroom reality.

Teacher 102 perceived little or no discrepancy between plan and reality. The information processed in this lesson was derived more from the plan than from the reality, and could be characterized as "image-oriented." Decision-points in this lesson were handled by routines.

Teacher 105 perceived some minor discrepancies between the plan for the lesson and the reality of the lesson as it progressed. The information that was processed in this lesson was derived more from the reality than from the plan, and can be characterized as "reality-oriented."

"Inflight" decisions were made in this lesson.

Teacher 103 perceived more serious discrepancies between the plan and the reality of the classroom. The information that was processed was more varied, possibly reflecting a search strategy, and can be characterized as "problem-oriented." Decisions in this lesson were postponed, and the teacher gave descriptions of the events rather than discussing decisions.

The case studies which follow illustrate in detail these differences in teacher information processing and decision making.

Teacher 102: Image-Oriented Information Processing

Teacher 102 had developed a first-grade classroom designed to promote cognitive independence in pupils, but social independence was not a basic goal. The general pattern of classroom interaction was similar to that of the total group of South Bay teachers, with heavy use of factual information processing, and a strong incidence of implementing instruction, directive procedures, and positive feedback. With regard to conceptions of pupils, this teacher focused primarily on pupil personality traits and on pupil ability/achievement.

In the stimulated recall interviews, Teacher 102 tended to provide explanations of the classroom routines that were being used, rather than to discuss decisions being made at the time. The decisions that were discussed were almost exclusively pupil-related decisions. This teacher's instructional concerns were highly focused on pupil learning, with lesson content (emphasis on skill or process), typical procedures, and commercially produced materials also being mentioned to some extent. The most frequently reported sources of information were observations of pupils' verbal behavior and teacher recall of previous knowledge about pupils.

The January lesson for Teacher 102 was one in which the teacher was working with two low-achieving pupils who were reading aloud from a Sullivan reader. The interaction patterns in this lesson were similar to the typical patterns for this teacher, except that the proportions of higher-order information processing and of student talk were much higher than normal, and corrective feedback was slightly higher than normal. The stimulated recall protocol was also quite similar to this teacher's overall pattern of response. The following excerpt from the stimulated recall protocol, with related segments of verbal interaction in the lesson, will illustrate the trend of this teacher's thinking.

[Jose is reading aloud.
Teacher: No.][5]

Teacher's comment: He's struggling, and I didn't know whether he'd get the "ah" for "want". Often times they'll say "want" (rhymes with "can't"). Then I give them a chance to try another sound for the "a". But I want them to do it themselves, so I'm waiting to give him a chance to do it. Then if he doesn't know it, I'll go ahead and tell him the "a" says "ah", and then he'll get it.

[Miles is reading aloud
Teacher: What is this sound?]

Teacher's comment: I do go over to Jose here too, so I'm teaching the sound to both of them even though Jose might not be following along in the book. They both have been given cards to practice these sounds at home. If I come across the sounds that they have on their drill cards, I circle them in the book, so they stand out a little bit.

[5]Material in brackets represents the action or dialogue occurring in the videotape.

[Miles is reading aloud.

Teacher: No. This has the "ah" sound.

Miles: Whant.

Teacher: I just want to hear "ah."

Miles: What

Teacher: O.K.

Miles: What the little rabbit knew...]

Teacher's comment: You notice I point to all the words for them because they're inclined to be wiggly. Eventually I'll switch them to markers and have them do it on their own. But sometimes, just moving the markers, they move it down two lines, and the mechanics of it is difficult for them. When I point it's easier to keep their attention, and then I can also point to the word they miss.

I noticed here that both of them are still separating their sounds a lot at this stage, so that's on my mind -- how fluently they're reading.

[Miles is reading aloud.

Teacher: O.K. What does this sound say now? Just this sound.]

Teachers' comment: I notice that Miles, quite often, when I ask him what a sound is, when I circle a sound, he wants to tell me the whole word. And I'm never quite sure now if he's memorizing the whole word or if he really sees the sound. I want him to know the "ow" in there, I don't want him just to know the word. I want him to know the "ow" whenever he sees it, so he'll recognize it in other situations (words).

[Jose is reading aloud, and says "want" (rhymes with "can't"). Teacher: No.]

Teacher's comment: You see, Miles is different. Miles can go ahead and say "want" (rhyming with can't) and then change it to "want" (pronounced correctly) because he knows it doesn't make sense. Others will say "want" (rhyming with can't) and not switch over. Jose doesn't switch over on his own. (At the close of this lesson, the teacher worked with a group of kindergarten children who were getting an early introduction to reading.)

This protocol demonstrates Teacher 102's tendency to provide explanations of the typical classroom procedures almost half of the time, and to discuss decisions being made during the lesson only about half of the time. The strong concern with pupil learning (knowledge of sounds, ability to recognize a given sound in a variety of "situations," or words) is clearly evident, also. Observation of pupils' verbal behavior was the principal source of information used, although the teacher also operated on recall of individual differences between these pupils that had been exhibited in earlier lessons. An important principle of instruction for this teacher was clearly stated (i.e., that pupils should correct their own errors), but it was also evident that this principle was selectively applied. (If Jose could not correct himself, he would be told the correct sound.)

The verbal interaction included in this segment of the protocol explains the high incidence of student talk and higher-order information processing recorded in this lesson. The reading these children were doing involved constant application of the decoding principles they had learned. (They were not relying on a sight vocabulary.) The teacher's frequent

use of corrective feedback is clearly evident in this protocol.

The verbal interaction in this lesson reflected fairly closely Teacher 102's overall objective to help pupils develop cognitive independence. The stimulated recall protocol indicated the teacher's general satisfaction with the events in the lesson. Alternative procedures were discussed in terms of standard procedures being used somewhat differently with different pupils. There was no indication that the teacher was questioning the effectiveness of any of these procedures. Thus the image that emerges from this protocol is that of a teacher who has selected and refined an instructional system that fits an important objective, and who is quite satisfied with the way that system is operating.

The responses to the pupil sort task at the close of this lesson exemplified Teacher 102's general emphasis on pupil ability/achievement, and a tendency to single pupils out. There were only six pupils present in the room during this afternoon lesson, so all the groups formed were quite small. The labels included:

1. pupils who were working nicely alone (4 pupils), and pupils working with me (2);

2. pupils who entered the class late and are now working with the kindergarten children I'm introducing to Words-in-Color (2); pupil who did work with the kindergarten children, but is now working alone (1); pupils who read with the aide while I read with the kindergarten children (2); pupil who reads with the morning group but stays in the afternoon because there's no one at home (1); and

3. pupils at the bottom of the class, who may not finish the first-grade books (2), pupils who should finish all the first-grade books (4).

In response to the interviewer's request that she group the pupils according to their success in the day's lesson, Teacher 102 formed two groups: pupils who did very well (3); and pupils that I didn't read with today(3).

The conceptions of pupils that were reported for this lesson were

focused on general characteristics of ability and achievement, rather than on specific behaviors observed during the lesson. In the stimulated recall protocol, teacher recall of prior information about pupils was a more frequently reported source of information than observations of actual pupil behavior. Together, these facts indicate that Teacher 102 was not collecting very much new information about pupils in this lesson. Teacher awareness was focused on instructional principles being used, and the few alternatives mentioned related to how these principles were applied differently with different pupils.

To summarize, the January lesson for Teacher 102 was an instance of a typical lesson in a smoothly-operating instructional system. The teacher plan and the classroom reality were quite closely matched. The teacher information processing in this lesson can be characterized as "image-oriented;" the teacher was operating primarily on pre-formed images of the pupils and of the instructional process. The reality of the situation did not "intrude" because there was very little discrepancy between the teacher's expectations and the actual events in the lesson. The decision points that did arise were handled readily by established routines, and few "on the spot" decisions were required.

Teacher 105: Reality-Oriented Information Processing

A principal objective in Teacher 105's third-grade classroom was for children to learn responsibility. With the exception of the scheduled meetings of reading groups, children had the option to choose which of several assigned tasks they would work on during each reading period. Teacher 105 was usually videotaped during a group reading lesson, however, and the classroom interaction patterns in these lessons were very similar to the "standard" pattern in the school, with high use of factual information processing and a persistent use of instructional implementation,

directive procedures, and positive feedback. In describing characteristics of pupils, this teacher generally focused on pupil personality traits (particularly pupil initiative and self-concept) and pupil involvement.

In the stimulated recall interviews, Teacher 105 tended to discuss decisions rather than to offer explanations of procedures. Pupil-related decisions were mentioned most frequently, but plan-related decisions and supplemental decisions were also mentioned. Instructional concerns expressed by this teacher included pupil learning, pupil attitude, lesson content (emphasis on information), and modification of procedures. The most frequently mentioned source of information was observation of pupils' verbal behavior. Teacher awareness was expressed primarily in comments about instructional principles being used.

The January lesson for Teacher 105 involved the slow reading group. The typical procedure for this group was used, i.e., introducing new words from the story (written on the chalkboard), followed by silent reading of one or two pages at a time, and reading aloud to answer comprehension questions.

The interaction patterns in this lesson were very similar to those typical for this teacher. Patterns of response on the stimulated recall protocol differed somewhat from the teacher's normal patterns in that more pupil- and plan-related decisions were discussed, and fewer explanations given. Modifications of procedures were mentioned more frequently than usual, and there was an increase in both observation of pupils' verbal behavior and teacher recall of prior knowledge about pupils. No comments were made to indicate teacher awareness of instructional principles used, teacher feelings, or instructional alternatives. The following excerpts from the stimulated recall protocol exemplify both the interactive behavior and the teacher's thinking in this lesson.

[Teacher reads names of children who are to work on the audio tape that is set up at listening stations in the back of the room, and calls up the group that is to read.]

Teacher's comment: I'm having to do a lot of different things at the beginning because my aide is out. She usually handles getting kids to work on the audio tapes and then I can just get started with my groups.

[Teacher: First of all, if you are in the car, you might be one of two places. Where might you be?

Pupil: The city.

Teacher; O.K.]

Teacher's comment: That was sort of interesting because I was looking for "front" (seat) or "back", and Mark came up with "city." My thought was different than what I'd planned. I thought, maybe I can get him to see opposites using "city." And I said, "well if you're not in the city, where are you?" And he didn't come up with "country," he came up with "town." He was thinking <u>same</u> things, and I was thinking opposites.

[Teacher: We have some people that are moving in our story today, and up on the board is the name of some people that are moving into the apartment house. Can you find something up there that you think is a name?

Pupil: Movers.

Teacher: Those are the people that move you, but can you find the name of the people that are going to move?]

Teacher's comment: Their interpretation of "name" and mine is really different at that point. They really got stuck on "movers."

[Teacher: I'm thinking of a clue that might be up there on the board that would let you know it's someone's name. (Pause) What is there different about people's names?]

Teacher's comment: At this point I realized that capital letters needed some work. They could not see that that helped them find a name .

[Teacher: What does your name start with?

Pupil: A capital.

Teacher: Does everybody's name start with a capital?

Pupil: I don't know.

Teacher: Ask Jerry and see if his does.

. . .

Teacher: So if you look up on the board for a word that starts with a capital letter, you might find the name of somebody. Anybody see a name?

Pupil: Bob Johnson.

Teacher: That might be the person who's moving in. O.K. Who can find me a word that ...]

Teacher's comment: I realized that we hadn't ever solved the name of the people who were moving in, and I just decided we've worked at it long enough, and it's going to come when they read the story.

[Teacher: Open to page 92. Look at the pictures. What can you tell me about the family that's moving in?

Pupil: They're Mexican.

Pupil: No. They're Black.

Teacher: Gee, we've got a lot of different opinions.]

Teacher's comment: They really got hung up on what nationality they were. I wasn't looking for that -- just that they were a family, that there was a boy -- sort of setting the situation. But they got into if he was brown or black. So I just sort of tried to change it a little bit.

[Teacher: We can't see the boy's face right now, but what kind of face do you think he has on?

Pupil: Brown.

Teacher: I think I worded that wrong, because I said what does his face look like. What kind of feelings do you think he has?]

Teacher 105 had planned the lesson carefully and had certain expectations about what pupils would say in response to questions. When these expectations were not met, the teacher did not view this as a pupil error, but rather as a difference in interpretation between teacher and pupil. The decisions, then, tended to be whether to work with the pupil's interpretation or to try to shift the pupil over to the teacher's interpretation. This resulted in the teacher's emphasis on pupil-related and plan-related decisions. In this lesson, interestingly enough, the teacher focused on teacher-pupil differences, rather than on individual differences between pupils. The interactive segments in this protocol exemplify direct teaching, with mainly factual questions asked, and with brief, factual answers from pupils. The use of positive feedback is evident, with the teacher accepting pupil answers even when they were not the answers expected.

The generally positive and accepting view of pupils that emerges from this protocol typified Teacher 105's whole approach to the classroom. This perspective probably contributed a great deal to this teacher's expressed belief that pupils should be given some responsibility for managing their own learning.

Responses to the pupil sort task following this lesson reflected this teacher's overall focus on involvement in instruction. The groups formed included:

1. involved in the lesson more than usual (2 pupils), attentive but not as responsive on their own as they usually are (3), had problems today that were possibly caused by teacher's wording (1);

2. students who interacted with each other, asking questions about capital letters in their names (4), students who stayed out of this interaction (2); and

3. pupils who have been on the perimeter but today seemed to be trying extra hard (2), pupils who were already conscious of the need to be concentrating during reading (4).

When the interviewer asked the teacher to sort pupils according to their success in the lesson, the groups formed were: the pupil who was doing the best (1); successful students, feeling good about themselves, not needing lots of extra help (3); unsuccessful students, whose reading problems were particularly noticeable today (2); and pupils who made a decision on their own as to what to do during this period (12).

Teacher 105's conceptions of pupils in this lesson were highly focused on the amount and type of involvement in instruction exhibited. This attention to specific pupil behavior in the pupil sort task was paralleled by the fact that observation of verbal behavior was the principal source of information mentioned in the stimulated recall protocol. Teacher recall of prior knowledge was mentioned as an information source for only 30% of the decision points discussed. These responses indicate that this teacher was collecting new information about

pupils during the lesson. There was no expressed awareness of the principles of instruction being used, or of alternatives that could be followed, but there was a clear emphasis on modification of procedures and plan-related decisions, indicating that the teacher had a plan and a procedure in mind.

To summarize, the January lesson for Teacher 105 was an instance of a lesson where the teacher did perceive a discrepancy between the lesson plan and the classroom reality in that pupils did not always respond in expected ways, but these discrepant answers were not perceived as pupil errors for the most part. The discrepancy was not critical to pupil learning. There was no perceived discrepancy in relation to the teacher's major goal, for the teacher noted that pupils took responsibility for self-management and followed the established patterns of classroom organization. The teacher information processing in this lesson can be characterized as "reality-oriented." The teacher was very aware of the pupils' actual behavior, although observation was focused by the plan for the lesson. Problems were handled mainly by "inflight" decisions, rather than routines.

Teacher 103: Problem-Oriented Information Processing

Teacher 103 attempted to foster both cognitive and social independence in children in her first-grade classroom. Most of the lessons observed for this teacher were small group lessons introducing new tasks and activities which pupils would later carry on independently. The teacher estimated that only about 10% of her instructional time was normally devoted to these group settings. This teacher's typical interactive pattern, in these group situations, showed a heavy use of factual information processing, with directive procedures, instructional implementation, and positive feedback also clearly in evidence. Student

and teacher talk was evenly divided. There was a low incidence of higher-order information processing exhibited in the verbal interaction, but this was somewhat misleading in this case, for the activities in which the pupils were engaged required a great deal of conceptual level information processing. This thinking was evidenced in their manipulation of materials, rather than in their comments, however. Teacher 103 was very close to the group norms in interactive verbal behavior. With regard to conceptions of pupils, this teacher focused on pupil personality traits (especially self-direction) and on pupil growth or progress in learning.

In the stimulated recall protocols, Teacher 103 tended to discuss pupil-related decisions, and to give descriptions of the events that were occurring. The principal instructional concerns discussed were pupil cognition, modification of procedures, and lesson content, with an emphasis on the skill or process being taught. The principal source of information identified by this teacher was observation of pupils' nonverbal behavior. Teacher awareness was high, with equal attention given to identification of alternatives, statements of instructional principles being used, and expressions of feelings experienced at various points in the lessons.

The January lesson was a fairly typical example of Teacher 103's group instructional process, as were the verbal interaction exhibited and comments on the stimulated recall protocol. In this lesson, the teacher was working with four children designated as fairly high in ability. The teacher presented three sentences written with picture-symbols to represent sounds. The children decoded these sentences, reading them aloud. Then, with the aid of charts that presented associated picture-symbols and letter symbols, the children rewrote the sentences

in letter symbols, using individual chalk boards.

A few excerpts from the stimulated recall protocol, including samples of the verbal interaction which the teacher was discussing, will serve to give the flavor of the lesson and this teacher's thinking.

[Pupils, in unison, reading picture-symbols: Look at that cake.

Teacher: Now, we're going to write the sentence on your chalkboards. We're going to start with the first word. What was the first word again?

Pupils: Look

Teacher: That's right. Look.]

Teacher's comment: After we had done this for a while, it came a lot easier. I was amazed at the little struggles that were going on to get that first word on that chalkboard. I had attempted to pick kids that I thought were pretty close together, but they weren't all at the same point.

[Pupil writing on chalkboard makes an error, writes "tat" instead of "that".]

Teacher's comment: I was trying to think about how I was going to correct any errors that took place, and couldn't come up with anything except just to say to a child, "Look at ___." What bothered me was that when I said, "Look at ____," it indicated there was a mistake, instead of just <u>saying</u>, "You've made a mistake."

She had some trouble correcting that. She'd written "tat" instead of "th," so she tried to squeeze in the "h", and there

wasn't room, so she had to erase the "a", then she tried to squeeze in the "a" and had to erase the "t." It was kind of like dominoes, you squeeze one in and they all fall over.

[Pupil has written "Look at that" on chalkboard. There is not enough room left to fit "cake" on the same line, but he starts to write it there anyway.

Teacher: Why don't you put that on the next line?]

Teacher's comment: I wish I had let him figure that out for himself, but I interfered. I should have just let him try to fit it in, and if he couldn't, then he would know that he had to go down to the next line. They've worked on chalkboards enough. But in my need to get through this lesson, I said, "Why don't you erase that, please?" I knew it as soon as I'd said it.

[Pupils reading aloud from their chalkboards, in unison:

Look at that cake.]

Teacher's comment: I decided I wasn't going to be too picky about their following my directions. I had said, "Point to your words," and Dennis was pointing, but Tricia over here wasn't, and Gina was still making her last letter. So, I just quickly was trying to think whether there was any point in my being that particular about it.

And I was aware that there was so much going on here. Steven was left handed and he was sounding out those words, yet he was having to concentrate on not rubbing out the chalk with his left hand and Tricia was concerned because her chart

way lying flat on the desk, and she's a little short, and was having trouble looking up at the letters. And Gina was concerned because she was having trouble making the letters. There were a lot of things to see.

[Pupils writing a second sentence on their chalkboards, while teacher observes.]

Teacher's comment: There were so many ways of approaching this with the kids. Dennis finished first, and poor Gina was still over there trying to get it done. It just reaffirmed for me not to do this kind of group thing very often because Dennis had to sit and wait, and Gina may have felt pushed and in competition with someone else. So while I think it's important to do things in groups sometimes, I was glad I didn't do this kind of thing all the time.

[This lesson ended with the teacher moving about the room talking individually with pupils who had been working independently.]

Teacher 103's attention to details of pupil's nonverbal behavior is clearly evident in this protocol, as is the tendency to engage in constructive self-evaluation. This teacher's objective was to have children master a new task, so that they could later work on similar tasks independently. The verbal interaction indicates that a fairly directive approach was taken for accomplishing this goal. The teacher's report of the interactive thinking that accompanied this approach suggests that the teacher was very aware of, and not very satisfied with, the compromises being made in this lesson.

The goal was to have children succeed at this task so they could proceed with confidence on their own. It was disconcerting to realize

that the children, though carefully selected, were actually quite different in their ability to handle the task. The goal was to have children identify and correct their own errors so that they could be more accurate in their independent work, but the pressures of time resulted in the teacher's compulsion to point out errors rather than wait for the pupils to discover them. This teacher's basic discomfort with the group setting was heightened by an awareness of so many detailed differences in pupil responses to the task. This type of discomfort probably had contributed greatly to the teacher's original decision to emphasize independent activity as the basic instructional process in the classroom.

Teacher 103's responses to the pupil sort task at the close of this lesson reflected similar concerns and attention to detail. The groups formed included:

1. children I interacted with over reading (11 pupils), children I didn't interact with (4);

2. children who were more at ease and sure of themselves today than they have been (4), children I would like to see become more self-confident (3), children who are already self-confident (4);

3. children who are making important gains in reading skills and growing by leaps (5), children who are fairly advanced and progressing step by step (6); and

4. children in the group who interacted with each other (2), children in the group who focused on the task and did not interact with others much (2).

On the interviewer-initiated grouping of pupils according to their success in this particular reading lesson, the teacher first formed one group of 15 pupils, saying that they were all successful because they got their work done. Then the teacher indicated that if pupils were ranked against each other, they would fall into four different groups. This final grouping was based mainly on ability/achievement and the

descriptors were: top children who sound out words really fast (4); two groups who are kind of in the middle (4) and (3); and bottom children who can sound out words but do it slowly (4).

Teacher 103's conceptions of pupils in this lesson were fairly specific in that three of the four teacher-initiated groupings referred at least in part to observations from the lesson itself. They were varied, rather than focused, for they dealt with pupil personality, growth/progress, and task performance. This attention to a variety of pupil behaviors was also evident in the stimulated recall protocol, where the principal sources of information were both verbal and nonverbal behavior of pupils. Teacher recall was mentioned as an information source on only 10% of the decision points discussed.

These responses indicated that the teacher was collecting a good deal of new information about pupils during the course of this lesson. The teacher had a plan in mind, but this plan did not serve to focus the observation of pupils very sharply.

To summarize, the January lesson for Teacher 103 was an instance where there was an important discrepancy perceived between the teacher plan and the classroom reality. The teacher comments presented in the stimulated recall protocol indicated concern with the differences between the teacher's expectations for the lesson and the reality of the lesson as it progressed. This concern was reflected in the coding of the stimulated recall protocol by the increase in description of events (from a "normal" 33% to 52% of the decision points) and an accompanying decrease in discussion of decisions made.

The discrepancy noticed by the teacher was primarily related to pupil learning, for comments focused on the problems of individual pupil differences that surfaced in the lesson. Since group instruction was

not the typical mode for this class, the sense of discrepancy was focused on this particular lesson, rather than on the instructional system as a whole.

The teacher information processing in this lesson can be characterized as "problem-oriented." A variety of new information was collected through observation of pupils during this lesson. This can be considered analogous to the search for information that typifies effective problem solving behavior. Decision making in this lesson was postponed. That is, few immediate solutions to problems were identified. The decision points discussed tended to be reports of the teacher's indecision, rather than adjustments for the lesson that was in progress.

Summary

The three case studies present an interesting progression with regard to the amount of teacher-perceived discrepancy between plan and reality. For these lessons, differences in amount of perceived discrepancy were accompanied by differences in the type of information about pupils that was processed during the lesson, as well as by differences in decision making behavior.

When little or no discrepancy between teacher plan and classroom reality was perceived, the teacher processed information derived largely from preformed images of the lesson and the pupils, and matters were handled by established routines. When a minor discrepancy between plan and reality was perceived, the teacher processed information derived largely from pupil behavior exhibited during the lesson, but observations of pupils were focused by the plan the teacher had in mind. Inflight decisions were made in this situation.

A clear shift was observed when the teacher perceived a more serious discrepancy between plan and reality. The teacher processed more varied

information about pupils. Observation was not clearly focused by the teacher plan, and took on some qualities of a search strategy. Decisions in this situation were postponed, and the teacher shifted from discussing decisions being made to providing descriptions of the lesson events.

The data from these case studies demonstrate that the amount of discrepancy between teacher plan and classroom reality was a critical variable in the information processing and decision making of these teachers. These lessons were not isolated cases. For 18 of the 60 lessons on which stimulated recall data were collected, teachers were also interviewed regarding the conceptions of pupils that they formed during that lesson. On the basis of the combined sets of data, these lessons can be classified as examples of image-oriented (four lessons), reality-oriented (11 lessons), or problem-oriented (three lessons) information processing. The apparent differences among these three types of lessons are summarized graphically in the Figure.

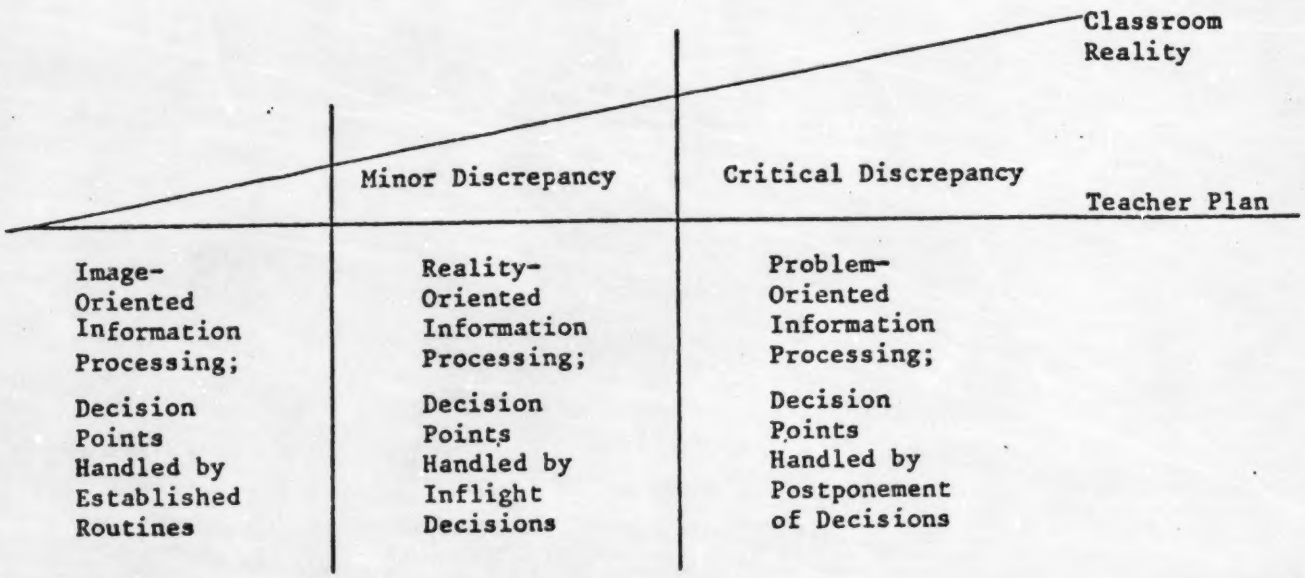
Classroom Reality
Minor Discrepancy
Critical Discrepancy
Teacher Plan
Image-Oriented Information Processing; Decision Points Handled by Established Routines
Reality-Oriented Information Processing; Decision Points Handled by Inflight Decisions
Problem-Oriented Information Processing; Decision Points Handled by Postponement of Decisions

Figure: A Graphic Summary of Observed Differences in Teacher Information Processing and Decision Making

Earlier studies of teacher decision making have separated the examination of preactive (teacher planning) and interactive information processing (e.g., Morine & Vallance, Note 4) and Morine-Dershimer & Vallance, Note 5). The South Bay Study findings suggest that future studies will profit from the closer examination of the relationships among the teacher plan, the classroom reality, and the patterns of interactive information processing and decision making. For it would appear that the amount of perceived discrepancy between teacher plan and classroom reality may be a crucial factor in determining whether interactive decision points are handled by established routines, inflight decisions, or postponement of decisions to a later time when the opportunity for more reflective thinking will be available.

Reference Notes

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Appendix

Category System for Stimulated Recall Protocols

General Explanation

This category system contains four major categories, each of which contains several sub-categories. The major categories are:

1. Type of Decision Point -- the kind of decision, or nondecision, that the teacher is reporting;
2. Instructional Concerns -- the elements of instruction that command the teacher's attention, i.e., that the teacher reports noticing;
3. Sources of Information -- the types of input that the teacher indicates s/he is alert to during the lesson; and
4. Teacher Awareness -- the varieties of cognitive and affective responses that the teacher mentions experiencing during the lesson.

At each teacher-designated decision point, the teacher's comments in the stimulated recall interviews are coded to indicate the type of decision point under discussion, the instructional concern(s) mentioned (more than one may be reported at any given decision point), and the sources of information referred to (may be more than one). When a type of teacher awareness is reported, this is also coded, but this does not occur at every decision point.

In the section which follows, each subcategory is defined, and examples are given of teacher comments that illustrate each subcategory. The sentence or phrase that determines the coding designation is presented in the context of the teacher's other comments, rather than in isolation, in order to give the reader a clearer idea of the application of this coding system.

The use of multiple coding, as described above, is illustrated below, with two examples.

1. There's decision making right here.

Type of Decision Point: supplementary decision

Source of Information: pupils' verbal behavior

Instructional Concerns: lesson content, information

I stuck something in. One of the vocabulary words they had was "metal" and as I was reading phrases and leaving out the words and developing their vocabulary, some of them were saying "medal and some were saying "metal". I hadn't planned to bring in the two separate meanings and the two separate spellings, but I just brought out the fact that they were saying two different words, and then we talked about the separate meanings. So they pulled me into deciding to go ahead and get that straightened out.

2. At this point, two of them had one answer and the rest of them had something different.

Type of Decision Point: pupil-related decision

Source of Information: pupils' verbal behavior

I decided to give them more clues as to what it could be, because they were confused; most of them were saying "sock" and it was supposed to be "sack." I said it could be made out of paper or cloth and they still said "sock." They have a tendency to jump to conclusions, you know, so I gave them more clues as to what it could be.

Teacher Awareness: principle of instruction

I don't like to tell them what the answer is, because it's not really helping them too much.

Instructional Concern: commercially produced instructional materials

Although some of the clues on these cards are really ambiguous, or things that these kids don't have in their experiences.

Subcategory Definitions and Examples

I. Type of Decision Point

A. Pupil-related decision. Teacher reports a decision to behave in a particular way, based chiefly upon characteristics or behavior of an individual pupil or group of pupils. Examples include:

1. When I realized Ruben might not be able to see, I moved my chair back.
2. Her speech pattern is going a little bit more rapidly, and therefore she's kind of slurring over her words. So I emphasized to say the words more clearly and distinctly. to not use lazy lips.
3. I decided I had done enough with them. They were getting antsy and needed to move on.

B. Plan-related decision. Teacher reports a decision to behave in a particular way, based chiefly upon the original goals of the lesson. Examples include:

1. I was having to bite my tongue to keep from showing them how to make a "K", because we've done the letter "K" and we're practiced it, and all three of them were having trouble getting the "K" written. My tendency was to rush in there and help them with the "K", but then I realized that, you know, this wasn't a handwriting lesson, and I'd have to focus on the "K" at another time.
2. I had written some questions on the board over there, and I had given them paper to answer the third question, about comprehension, and I noticed that it wasn't working out like I thought, because they were so hung up in writing sentences and spelling a word right that they were missing the point. I just really wanted to know if they had read the story while I was trying to get the SRA group together, and so I decided I'd just abandon the idea of answering the questions on paper, and they could just tell me orally what they had read.

C. Supplementary decision. Teacher reports a decision to include a topic or activity that was not part of the original plan, based on a sudden idea, or on the suggestion of a student. Examples include:

1. Right here I decided that they could all go and get their dictionaries, since they thought Chris was cheating by using his (to think of words beginning with "ci"). I figured that if they could find "ci" in the dictionary, they could find the words, and that was perfectly all right- Kill two birds with one stone. I'm going to have that kid (Chris) plan all my lessons.
2. I hadn't planned on that at all, but it struck me as I was talking about today's lesson, which is a little whimsical thing about this cute little walrus, that we were going

to read another story about a walrus later that's really a tragic thing. One of the characters is gored to death by a walrus. So I thought, I think I'll show them that here's another story, but it's really a different one.

D. Explanation of routine procedures. Teacher explains a routine that is being used in the lesson, but does not report any interactive decision in relation to use of that routine. Examples include:

1. You'll see that they aren't paying very much attention. I don't make them follow when another child is reading. For some of them, just to concentrate when they themselves are reading is enough, much less trying to follow when someone else is reading, so I don't insist that they look at each word as another child is reading.
2. When I'm going around checking with individual kids like this, I make a list of who it is I listen to -- if I listen to them reading sentences, or listen to them reading a book, or watch them doing a worksheet--and then I just assess. I either give them a plus, or a check, or a minus, and then use that as a basis for who's going to move on to what at some future point.

E. Description of specific events. Teacher describes what is happening at that point in the lesson and may give background information, but does not explain routine procedures related to the event or report any decision related to it. Examples include:

1. I noticed that Lonnie came up to the board three times and never wrote one word. If you asked her anything about what we did, I don't think she could tell you one thing, 'cause I don't think she's paying attention, but she wanted to be up there.

2. Now this little girl, I've had a hard time getting her to come up to me with things, and to question things, and I talked to the parent at conference time about this, and so there's been parental encouragement for her to come up and ask questions, and I've encouraged it a lot, so it's a good feeling right at this moment to hear her asking these questions.

II. Instructional Concerns*

A. Pupil learning. Teacher comments upon what pupil(s) already knows or about recent pupil changes in knowledge, or about what pupil(s) does not yet know but may need to know. Examples include:

1. She was saying something like "tub." She wasn't putting the "g" sound at the end. She was the only one that didn't have that sound. I asked her if she knew that sound, because it's kind of a tricky one for them, and she said she didn't, so I had another child say

*The term "concerns" is used here in the sense of "matters that command attention," rather than in the sense of "worries."

the word so she could hear the sound.

2. He's having trouble with the difference between a capital H and a small h here, so I was wondering at this point just how to get across the idea that it's the same sound, the same word. I'll probably work with him on some flash cards, using this type of thing with different words, and getting him zeroed in on the fact that it's the same word regardless of whether it begins with a capital or small letter.
3. He had something pretty hard on that paper. It was on multiple meanings of words, but it included some obscure meanings of common words. I decided to give him more help than I would have some of the other kids, even though he's a strong student, because I knew it was a hard paper.

B. Pupil attitudes/affect. Teacher comments on feelings that pupils may be experiencing. Examples include:

1. He was giving a definition, and he's sort of a smart-alecky kid, but when he gave it in that way, the kids laughed and he was embarrassed, and I caught his embarrassment. They were laughing at him because he said "it's the player you play with." So I was trying to show that in some small way he could be right, but still clear up what an "opponent" really is.
2. Madeline really needs more direction, more reinforcement. She's one that if my finger is there to guide her she feels much better. So I have to repeatedly go back to her and assist her, and I have to pull away a little bit to see if she can struggle. I want her to struggle a little bit on her own, but I don't want her to struggle so much that she's going to be defeated.

C. Pupil behavior/attention. Teacher comments on observations of pupils related to discipline or classroom management. Examples include:

1. I was watching to see if they were paying attention. I'm very conscious of whether or not they are paying attention, because they are very wiggly, and they don't always give me their attention.
2. Do you hear that "drum" going in the background -- somebody's banging on the desk, or something? I was wondering, let's see, how can I solve this one now, without having to leave this post. I noticed Barbie (a cross-age tutor) was giving flash cards back there, and I made a decision right about then to have Barbie go over and speak to them.

D. Lesson Content-information. Teacher comments on the facts or concepts that are being covered in the lesson. Examples include:

1. There were several that couldn't answer. So I'm asking one person to go back and read the last paragraph aloud to the group, to find out. And that way I'm trying to emphasize, you know, that things are divided into paragraphs. I've been showing them about paragraphs.
2. We talk about Japanese customs all the way through these stories, about taking your shoes off as you enter, and so forth, and one

of the Japanese customs was giving two toy dogs to a newborn baby, so that's why I asked them to skim the page, 'cause I wanted them to find the Japanese custom.

C. Lesson content - skill or process. Teacher comments on the techniques or procedures that are being taught in the lesson. Examples include:

1. I'm trying to get them to learn a decoding process, and so I was trying to assess if they were ready, if they could decode the words from the picture sounds that I was giving them, and if they were going to be able to do that when they got to the worksheets. I decided that Alfonso really needed a little more practice, and so did the child on this side. Well, actually, all three of them needed it, so that's why I continued.
2. I'm really more concerned now with the process and procedures of the classroom, and kids working independently without me having to really zero in on them. I find that if I can spend more time now in getting techniques and procedures and the self-motiviation going, then I'm going to have less of a hassle later on, in pulling groups out and doing small group instruction. So that really is the main focus of any of the reading lessons I'm doing right now.

F. Typical procedures: Teacher comments on the instructional or management routines that are being used in the classroom. Examples include:

1. I realized that we had just about come to the end of this part of the story - we'll read the next part tomorrow - so I gave them the worksheets to do, and also gave them the directions. I always like to read the directions with them, and then they do it at their seats.
2. I wanted the answer that they had never owned any shoes, and when he said that they were out of shoes (barefoot) all summer, then I realized that he had not read it carefully enough, and that's why I want him to find it, to prove it to me. I try to do that (with an incorrect answer), and I'll also, if someone else is eagerly waving their hand, I'll call on them, too, to see what their answer is. And then if I get several answers, I'll ask them all to reread it, to see what's right.

G. Modification of procedures. Teacher comments that a typical instructional or management technique is being changed slightly during this lesson. Examples include:

1. They were getting antsy, and they needed to move on, and I was feeling the need to get to the other kids. I was trying to decide how much I should give them as a contract (Independent work) because they had spent so much time with me. I knew I couldn't give them a full contact, expecting them to do as much as the other children had done, so I was trying to decide what I should cross off (on their contracts).
2. I was bothered, because back at this table were a group of kids with my aide, getting things checked, and over at that table were the kids just finishing their audiotape drill, and my aide should really have been over there to meet with those kids and get them settled, and both groups were making noise. And I kept waiting for her to settle down one group or another, and it didn't happen. So I finally decided, O.K., I'm going to have to stop and at least get one group quieted. Maybe that will get her to get her group quieted down.

H. Commercially produced instructional materials. Teacher comments on published textbooks, or other manufactured teaching materials being used in the lesson. Examples include:

1. It may go against the grain in a lot of people, but the repetition in this program is exactly what poor learners need. Sometimes repetition can get boring, and anyone would tune out, but that doesn't seem to happen in this particular program. It seems to be a challenge to them, but the repetition is, I think, what gets through, because if you hear me say "mmmm" for ten months, you're gonna know what "mmmm" is by then. It's phenomenal how many times you go over the sounds in months, or in a week, and they do catch on.
2. There was one thing I noticed here. The type was bothering her--something about the letter "j". And there's not much I could do about that. This has happened to her on two or three occasions. It's not a very good "j" they have in this book.

I. Teacher -- produced instructional materials. Teacher comments on materials he/she has prepared for use in the lesson. Examples include:

1. I'm trying to get them away from my drawing everything for them, and so sometimes (on a worksheet, instead of putting a word and a picture for that word) I leave a space blank, so they can do their own picture, and also so they can sound that word out for themselves, because if they have a blank space there, then they will read the word to find out what to draw. Eventually I will have them draw all the pictures themselves (as well as copy the words).
2. She interrupted. The paper she brought up was made up of sentences that I had put on a ditto, and the words in these sentences were taken from books that she had read previously and she knew every word on that page. But sometimes these children -- when I say sometimes, I mean oftentimes -- they can read the print in one book, but when we change into another book with the same vocabulary, they don't recognize one word. I've often wondered if other teachers realize that, or know it, or believe it, because I believe it, - And these dittoes are for that purpose, so that they get to see the words in different context.

J. Plan -- related pacing. Teacher comments on timing of activities, or speed of content coverage in a lesson, giving a lesson plan, daily schedule, or long-term curriculum outline as the principal reason for what is occuring. Examples include:

1. The way I have it set up, there are 96 pages in each book, and if we take 5 pages a day, we can do one book a month, and it works out good that way. It's not too much, and its fair.
2. I looked up at the clock, because a lot of times I forget about recess and we run over, so I was trying to keep track of the time, so I could see if we were going to have enough time (for them to do their worksheets).

K. Pupil-- related pacing. Teacher comments on the timing of activities, or speed of content coverage in a lesson, giving pupil characteristics or pupil responses as the principal reason for what is occurring. Examples include:

1. How long I stayed on each word here depended on how quickly they got it. I kind of waited until they all got "aaa" (short a). Someone started out with "aaa" and "cat" but I waited until they all got "cat." I think someone was saying something else, like "can", at first, and I waited until they finally caught on, and then went on.
2. In my mind I'm always trying to decide, when one person like that is having trouble, whether I should take the whole group's time. And it depends on how much time it takes, and how much help the child needs. 'Cause there are a few in that group that I take by themselves afterwards because they really aren't reading as well as the rest of the group. But it's always a decision I have to make, whether to take the time then or later.

III. Sources of Information

A. Observation of pupils' verbal behavior. Teacher indicates awareness of an oral communication from a pupil. Examples include:

1. I was asking them to start making a robot at home, and I heard someone whisper, "I'll get my dad to build one." And then I thought, O.K., I'd better nip that one. I think probably some parents are going to help their kids more than others. But I try when they come in with them to accept them, regardless of what they look like. Like last year, I accepted the one made out of a cereal box, that didn't really look like a robot.
2. He said "electric" and the word was "electrical." I wanted him to say the word correctly. So I looked back at him. I didn't say anything. I just looked at him.

B. Observation of pupils' nonverbal behavior. Teacher indicates awareness of a pupil's facial expression, or posture, or gesture, and reads meaning into this. Examples include:

1. I related to what she had just read and made a comment about it, to see her reaction, to see if she remembered what she had read, and the way she smiled at me, she knew what she had read, and so this is a way of checking up on comprehension.
2. I was seeing them, you know, searching around the bottom, and looking up and around, and kind of looking at each other's chalk boards, and I was just taking that as a clue that they weren't zeroing in, writing the way they were supposed to.

C. Teacher expectations. Teacher comments focus on their expectations regarding pupil behavior and learning, rather than on their actual observations. Examples include:

1. I was thinking that it was going to be an uphill pull to get them to pay sufficient attention for me to explain the lesson, and right after that, even though I went over it with them, they didn't know what to do-- they didn't follow. But this is a very low group, and you would have to stand on your head.
2. That was a decision, for me to ask them, "what sound does 'a' make?" before we actually got into our books. I guess I was trying to tune them in before we got started on our books, because like the word "man" and "mat" both begin with an "m", and after teaching as long as I have, I'm fully convinced that some children only look at the beginning letter and guess. They don't see the whole thing, and you've got to train them to do that.

D. Teacher recall of prior knowledge. Teacher indicates awareness of information relative to a pupil or event, specifically, information that was obtained before the lesson began. Examples include:

1. There I'm making a special effort not to upset Cheryl, because she has been having problems here and at home. She has home problems, and so she's been very sensitive, and she's had crying spells, and so forth, and so I was really trying not to upset her. I asked her in a nice way to read silently.
2. I'm re-explaining the directions here because she raised her hand and asked for help. Now, the boy next to her will not raise his hand at all or ask for any help, no matter what, and a lot of times his things are wrong, so as I was passing her, I glanced over his shoulder to see how he was doing.

E. Teacher records. Teacher indicates use of information that has been previously recorded. Examples include:

1. There was some indecision here because I thought this group was working on chart 5 (Words-in-Color chart), but some of the children thought it was chart 6. That's when I decided to go back to my desk and check my notes, and it was chart 5.
2. There I stopped because I noticed one group that was being tutored, they weren't really looking like they were paying attention. They were talking instead of reading. But I couldn't remember what the (cross-age) tutor's name was, so I had to check my schedule to see who the tutor was.

IV. Teacher Awareness

A. Principles of instruction. Teacher states a general rule that s/he follows in a certain type of situation. Examples include:

1. I won't allow a child to just, to struggle over a word. If they come and ask for help, then I will read right along with them. I won't read it for them, I will read with them, and I will give them the sound. If they say, "I need help with the sound," I will just give it to them, and then have them try to put that sound into a word. Otherwise it's a testing situtation, not a learning situtation.
2. If we're just doing creative writing, and they ask me how to spell a word, then I'll write it on the board. But in reading (seatwork) when I have to help so many people and they're doing so many different things, I don't have time to spell a lot of words and so forth. So I really don't care about how they spell

a word at that point. The only time I care about how to spell a word is in spelling, really.

B. Teacher feelings expressed. Teacher describes emotions s/he was experiencing at a particular point in the lesson. Examples included:

1. I was really happy with what they did there. When I said, "If you looked it up in a dictionary, what would it say?" They were just blank, and then they laughed 'cause nobody could think of a definition. But then they thought a minute longer, and they started using words like "vibration," "repeating," and I was really happy. Nobody came up with "reverberation," but they came up with synonyms for it, and I felt that they knew more what I meant by defining "echo" than they had two minutes before, and I felt really gratified.
2. I'm getting irritated with Deobrah here, because for some reason I guess she really wants my attention. She will call me, and I'll walk clear across the room to her, and she asks me some dumb question that she already knows the answer for. She was buggin me. I wish someone would show me how to kind of stop her from asking just really dumb questions. You know, like -- Do I write on this line or this line? Do I breathe?-- something that's just obvious, that she could solve herself. That's what I was thinking about. It had nothing to do with the lesson.

C. Alternative procedures indentified. Teacher describes a technique or procedure that s/he considered using in a given situtation in place of the one s/he actually used. Examples include:

1. I'm deciding here that if I hold the chart up and just ask them to find the "a" sound and write it, I would be purely testing. And there was a flicker in my head of, am I going to test at this point or am I going to assist, and I decided that I had to assist. I wanted it to be correct the first time, so I would assist all the way through-- you know, look for this clue, look for this next clue --and then I'd test later on.
2. Tony came back in September and he was reading with no periods, no nothing, he just went on. And I called periods "stop signs" and said, if you're driving a car and don't stop at the stop signs, then you're going to get hit by the car coming around the block. So anyway, here it is the beginning of the fifth week, and I notice that he's taking a breath at each period, and starting over again. He didn't every time, but it wasn't as bad today as it has been, and I didn't mention once about stopping for the period. I should have praised him for it, but I was afraid to interrupt him, because he was doing so well.

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